the MODERN HOSPITAL and its ELEVATOR NEEDS

HOW MUCH ELEVATOR SERVICE?

"HOSPITAL SIZE" ELEVATORS

AUTOMATIC CONTROLS

ELEVATOR ENTRANCES

FREIGHT ELEVATORS

HOSPITAL DUMBWAITERS

BETTER ELEVATORING IS THE BUSINESS OF Otis

HOW MUCH ELEVATOR SERVICE

If you are an architect, engineer, or administrative official, concerned with the planning of a new hospital building or the modernization of an existing one, you want to know how other hospitals have solved their vertical transportation problems.

In this booklet we have tried to picture the various types of equipment that modern institutions are using to meet specific needs. Also, we have outlined for your use some basic information about hospital

Stanley D. Anderson & Associates, architects. Schmidt, Garden & Erikson, consultants. Thurvald Nielsen Company, contractors. **Even the small hospital needs efficient transportation to carry people, supplies, and equipment from floor to floor. Three-story, 65-bed Lake Forest Hospital, in suburban Chicago, has a "Collective Control" automatic passenger elevator, a service elevator, and a dumbwaiter.**

elevator installations. This information is based on the experience which Otis has gained from many years of dealing with the elevator problems encountered in large and small hospitals in every section of the country.

a different problem in every hospital

Important as it is, however, to know what other hospitals have done, your hospital has elevator problems all its own. Each installation, whether for a new building or for the modernization of an existing structure, must be studied individually. That is why we consider proper planning — fitting the installation to the institution — as important as well-built motors and elevator cars.

It is for this reason that we lay great stress on the Otis Engineering and Planning Service and invite you to use it, without cost or obligation, to determine the kind of vertical

does a hospital need?

transportation system best fitted to your hospital's needs. If you will call your nearest Otis office, our engineers will make an individual, impartial study of the vertical transportation problem in your hospital and will recommend a solution based upon the facts.

fitting the elevators to the hospital

Elevator installations differ from hospital to hospital because hardly any two institutions have quite the same vertical transportation requirements. They depend on such factors as the volume of traffic from floor to floor, the varying proportions of passenger and vehicular, staff and visitor traffic, and the occurrence of traffic "peaks". Since elevator "traffic" for the most part consists of human beings in various states of health and on errands of varying urgency, the elevator equipment must take account of human factors as well as other traffic factors in the hospital to be served.

A large hospital, obviously, needs more elevator service than a small hospital. According to one estimate, elevators should be able to handle 20 passengers a day – including staff members, patients, and visitors – for every bed in a general hospital. Even hospitals of the same capacity, however, will have different elevator requirements depending on height and layout, the type of hospital and the nature of its service facilities.

modernizing for self-service economy

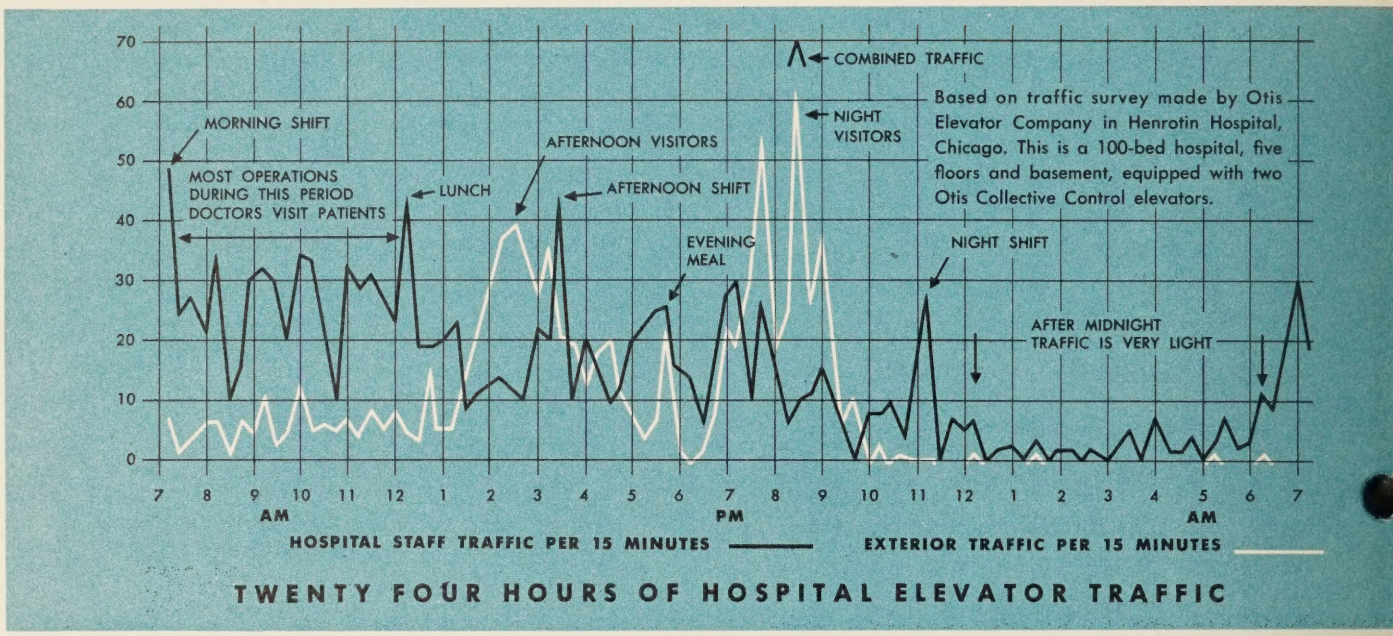
For the same reasons that new hospitals install automatic elevators – to lessen their dependence on scarce "help" and to keep expenses down – existing institutions are modernizing old elevators. A hospital can often convert attendant-operated elevators to self-service without having to replace hoisting machines or other basic components. Since hospitals use their elevators 24 hours a day, seven days a week, self-service operation brings substantial savings.

Weiss, Dreyfous, Sieferth, architects. George A. Fuller Company, contractor. Main building of Charity Hospital, New Orleans, La., is 20 stories tall and houses 2,648 beds. Its 18 Signal Control elevators are supplemented by six Collective Control passenger elevators, a sidewalk elevator, a mortuary elevator, and a dumbwaiter. Other buildings in this hospital group are served by a total of 17 elevators and one dumbwaiter.

Traffic Peaks . . . and how they are handled

The modern hospital abounds in special facilities — such as operating rooms, X-ray departments, diagnostic laboratories, and diet kitchens — all of which generate elevator traffic. To minimize the burden on elevators, hospitals often locate clinics and other outpatient facilities on the first floor.

As the chart shows, elevator traffic is normally concentrated during certain periods of the day. "Exterior" elevator traffic — visitors, for the most part — usually originates on the main floor; staff traffic may be bound to or from any floor of the hospital. Elevator capacity may be taxed by visitor traffic even if it is carefully controlled.


70
60
50
40
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20
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MORNING SHIFT
MOST OPERATIONS DURING THIS PERIOD DOCTORS VISIT PATIENTS
LUNCH
AFTERNOON VISITORS
AFTERNOON SHIFT
EVENING MEAL
COMBINED TRAFFIC
NIGHT VISITORS
Based on traffic survey made by Otis Elevator Company in Henrotin Hospital, Chicago. This is a 100-bed hospital, five floors and basement, equipped with two Otis Collective Control elevators.
NIGHT SHIFT
AFTER MIDNIGHT TRAFFIC IS VERY LIGHT
7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7
AM
PM
AM
HOSPITAL STAFF TRAFFIC PER 15 MINUTES
EXTERIOR TRAFFIC PER 15 MINUTES
TWENTY FOUR HOURS OF HOSPITAL ELEVATOR TRAFFIC

how many elevators? . . . and how fast?

The amount of traffic one elevator can handle depends on its size, lifting capacity, speed, and type of control . . . factors which impose practical limitations on handling capacity. If traffic requirements exceed the capacity of a single elevator, more than one should be installed.

Even a small hospital will often have two elevators. Service can then be continued without interruption if one elevator is out of service for any reason, and both cars can be assigned to a single job—such as carrying visitors—to handle heavy traffic. Three elevators are usually adequate for a hospital up to four floors high and 200 beds capacity.

In a hospital large enough to have separate service and passenger elevators, they may be located apart to keep one class of traffic from interfering with the other. On the other hand, if there are several passenger elevators—or several service cars—it is usually desirable to group them together in an elevator "bank" for flexibility of service and ease of supervision. The service elevators can be arranged to take part of the passenger traffic load during heavy peaks, such as the visiting periods.

Capacity to handle traffic depends not only on an elevator's size, but also on its speed and type of control,which determine the number of trips it can make during a given period. Taller hospitals require faster elevators to carry the greater

volume of vertical traffic, as well as to reduce traveling time to the upper floors. The table shows the usual elevator speeds for hospitals of different heights.

efficient "powerplants" for hospital elevators

Otis manufactures elevator "hoisting machines" with a wide range of speeds and lifting capacities, so that each elevator can be matched with the most efficient type of "powerplant". For elevators with speeds of 350 feet per minute and less, a geared type of drive is generally used.

Gearless machines are recommended for elevators that travel faster than 350 feet per minute. The motor and the hoisting "sheave" turn on the same shaft at slow speed, resulting in the efficiency and silence of gearless power transmission. A gearless machine will usually last as long as the building itself . . . in numerous cases where the Otis Elevator engineers have modernized elevators 30 and 40 years old, they found the original gearless machine still good for many more years.

controlling the elevator motor

Starting, stopping, speeding up, and slowing down an elevator require a control system that varies the amount of power delivered to the motor of the hoisting machine. A system of alternating-current resistance control can be used for speeds up to 100 feet per minute where low first-cost is an important factor.

But where closer control of the motor is needed for fast and smooth acceleration and retardation, self-leveling, and automatic operation, a system known as "unit multi-voltage" is preferred. With unit multi-voltage control, the elevator motor's speed increases or decreases smoothly—resulting in starts and stops so gentle that passengers are virtually unaware of the elevator's motion.

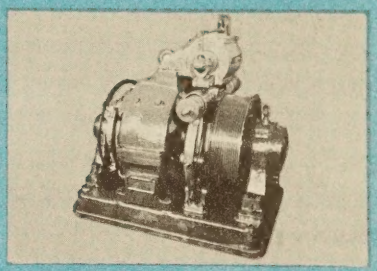
Economizing on electric power and easing the strains on hoisting machine and other parts, unit multi-voltage control also lends itself most readily to the automatic methods of elevator operation described on the following pages.

"HOW FAST SHOULD HOSPITAL ELEVATORS TRAVEL?"

1 - 2 floors	50 - 100 f.p.m.
3 - 5 floors	200 - 350 f.p.m.
6 - 10 floors	400 - 500 f.p.m.
11 - 15 floors	500 - 600 f.p.m.
16 - 20 floors	700 - 800 f.p.m.
20 or more floors	800 - 900 f.p.m.

Suggested speeds are approximations, based on usual practice—special conditions may warrant departure from these average speeds. Table refers to number of stories above ground and assumes, in addition, one basement level.

For elevators traveling at 400 feet per minute or faster, gearless hoisting machines, like the one at the right, give quiet and efficient operation over a 30-year or longer life span.



Fugard, Burt, Wilkinson & Orth, architects. George A. Fuller Company, contractors. Signal Control elevators handle the traffic in large, busy hospitals, like Wesley Memorial in Chicago. This 556-bed, 20-story institution has two Signal Control passenger elevators, two Signal Control service elevators, and another Signal Control elevator that can be used for either freight or passengers, depending on requirements.

AUTOMATIC CONTROLS

The control system determines to a great extent how much service an elevator installation will give and how much it will cost to operate. The sharpest differences between old-fashioned and modern elevators lie in their control systems.

Today most control systems feature automatic operation for maximum service with minimum dependence on trained personnel. Automatic elevator operation can ease the hospital "help" problem. Not only can automatic controls cut operating costs, but they can provide prompt elevator service 24 hours a day, whether or not attendants are available.

for small and medium sized hospitals — FULL COLLECTIVE CONTROL.

For their requirements, Otis recommends a system of automatic operation known as "Full Collective Control." It needs no attendant—any staff member can operate the elevator by pressing buttons at the landing and inside the car. An "optional-attendant" feature is usually recommended so that, during visiting hours when traffic is heavy, an attendant can take over control of the car to prevent overcrowding and to speed service. The attendant's duties require no special training and can be performed by an employee who works elsewhere when the car is operated "self-service."

how collective control works

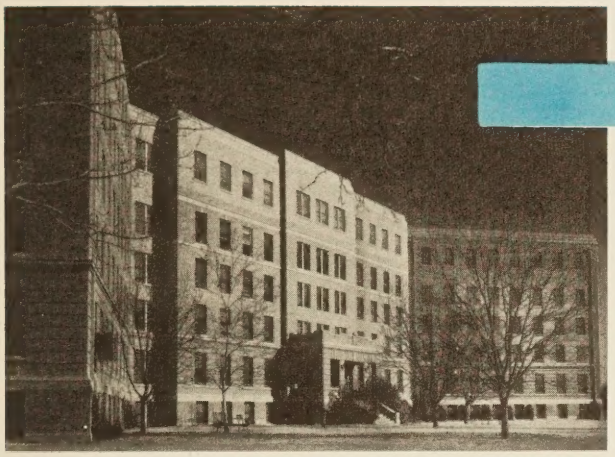
Calls are registered by pressing landing buttons and car buttons. As the elevator travels up and down the hoistway, it answers calls in the order in which the floors are reached. On UP trips it "collects" passengers who registered UP landing calls and stops to discharge passengers at floors for which car buttons have been pressed. When the car answers its highest call it automatically reverses for its DOWN trip and proceeds to answer DOWN calls. The car automatically levels itself with the landing at each stop, a feature of particular importance in hospitals, where beds, carts, or stretchers are often wheeled on and off the elevators.

When the elevator is set for "self-service", car doors open and close automatically and the car operates in response to calls registered by passengers who press buttons on the car panel or at the landings. When the elevator is operated by an attendant, he registers the car calls as passengers enter, and by a single motion he controls the closing of doors and starting of the car. From then on, the elevator is controlled automatically.

for emergency service

Another special feature of the Otis Collective Control system available for hospital elevators gives uninterrupted control of the car to any person having a special key. This emergency

distinguish the modern elevator



Hughes & Olds, architects. Rose Construction Company, contractors. When a sixth story was added to Hendrick Memorial Hospital, in Abilene, Texas, its old elevators were replaced with modern Collective Control equipment. This 225-bed building now has a Collective Control service elevator, two Collective Control passenger elevators with the Optional Attendant feature, and a 400-pound Multi-Button dumbwaiter for food distribution.

control will, for example, let the elevator carry a stretcher case directly to or from the operating room without stopping for intermediate hall calls, or will permit a physician or nurse to hold the car at a floor while waiting for a patient. All landing calls registered before and during "emergency" operation are stored up and answered after the car is returned to normal service.

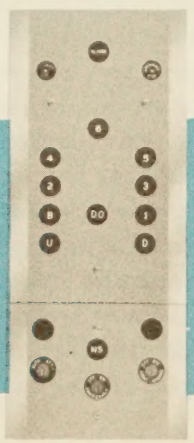
when two or three elevators are needed

Two Collective Control elevators located in a group can be coordinated by "Duplex Collective Control" so that they operate as a team for efficient "two car" service. The control mechanism automatically assigns each landing call to the car that can answer it most efficiently.

When one car is used to carry food carts or for other "service" traffic, it can be equipped with a special switch to disconnect the car from the Collective Control system. When the switch is operated, the "service" car responds only to calls registered on its own control panel. An inconspicuous set of special "service" buttons at the landings permit service-car calls to be registered on an annunciator in the car. While the service car is disconnected, the other car continues to operate as a Full Collective Control elevator and answers all calls registered by the regular landing buttons.

To coordinate three automatic elevators, Otis has developed a coordinating system called "Triplex Collective Control." Like Duplex, Triplex Collective Control automatically assigns calls to cars for efficient service, permits either attendant or self-service operation, and permits one car to be operated independently as a "service" elevator. Two or three automatic elevators, "teamed up" by Duplex or Triplex Collective Control, make a flexible system for the small or medium-size institution. One of the cars can be used for passengers during visiting hour peaks, and exclusively for "service" traffic during meal times and other periods.

Roland M. Linder and Earl C. Morris, architects. Mead & Mount Construction Company, contractors. Denver's 256-bed, seven-story General Rose Memorial Hospital is equipped with Collective Control elevators, two for passengers and one for service. All three have the Optional-Attendant feature.



Car control panel of Collective Control elevator. For "self service" operation, passengers press numbered buttons, on upper section of panel, corresponding to floors where they want elevator to stop. Emergency control key-switch, on lower section, is used by staff members when emergency or surgical cases require individual uninterrupted transportation. Lower section may also include key-switch, illustrated, for attendant operation when traffic is heavy.

Handling Heavy Traffic Efficiently in the Larger Hospital

In the larger, taller hospital or medical center, where facilities are distributed vertically rather than horizontally, people — nurses, physicians, students, and patients — are continually moving from floor to floor.

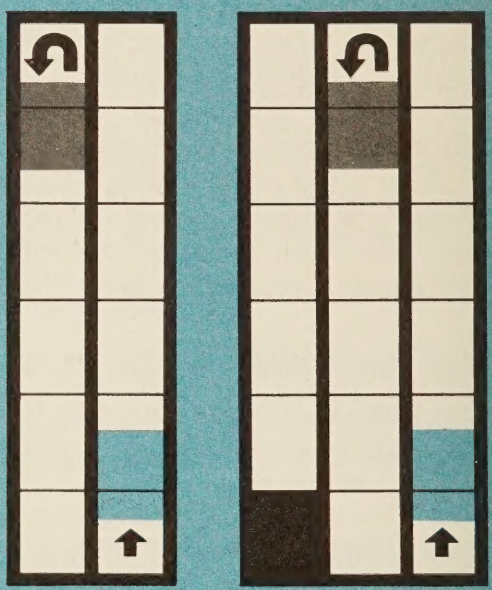
For efficient service under these traffic conditions, Otis has perfected the Electronic Signal Control elevator which can handle heavy traffic rapidly, safely, and economically.

In a single motion the attendant controls the closing of the doors and starting of the car. From then on, the actions of the elevator are controlled automatically. The elevator stops at floors where passengers have touched landing buttons or for which the attendant has pressed buttons on the control panel in the car. As the car arrives at a floor, it levels itself, stops and opens its doors—all automatically.

If a hospital has Electronic Signal Control elevators, they can be automatically coordinated for maximum efficiency. For two or three-car installations, an Otis coordinating system known as "Timed Spacing", which operates without an elevator supervisor, will keep the cars distributed and the service uniform. It automatically signals a car to start up from the main floor when the preceding car has reversed and started down, if there are waiting calls which the preceding car cannot efficiently answer.

One of the Electronic Signal Control elevators is usually equipped with the "non-attendant night service" feature for self-service operation during off hours—an important economy feature.

I. E. Loveless, architects. Southwestern Construction Company, Houston, Texas, contractor. One Collective Control elevator and three dumbwaiters serve the four-story, 100-bed Pediatrics Building of St. Joseph's Infirmary in Houston, Texas.



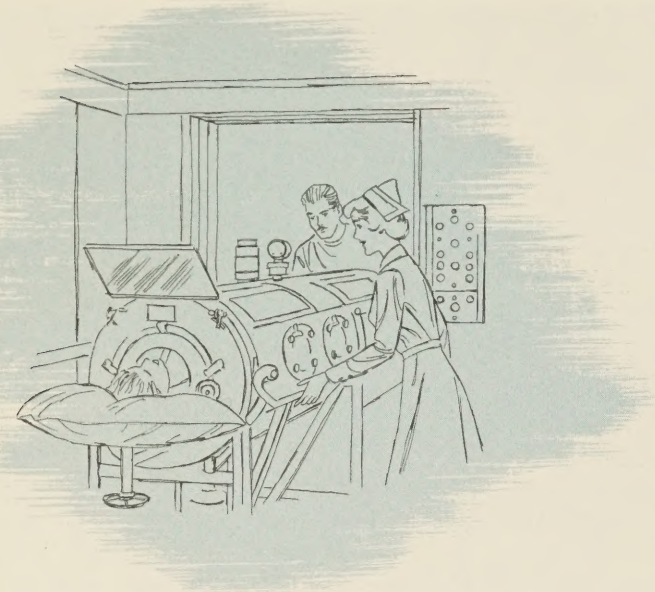
When two or three Electronic Signal Control elevators are operated in a group, a control system known as Timed Spacing is the automatic "starter" that keeps the cars distributed and the service uniform. A two-car Spacing system starts one car up from the main floor in response to calls, and starts the second car up when the first car has reversed and there are calls from floors that the first car has already passed. In a group of three elevators, Spacing usually keeps one car answering up calls, the second car answering down calls, and the third waiting at the main floor.

Skidmore, Owings & Merrill, architects. Grove, Drake & Psaty, general contractors. F. O. Loinzell, director, Ohio State Department of Public Works. To minimize interference between staff and "outside" traffic, elevators in recently completed University Hospital at Ohio State University, Columbus, are grouped in two banks. This 12-story, 600-bed building has three Autotronic elevators, for students and visitors, behind windowless wall that rises above long marquee, plus bank of two Electronic Signal Control service elevators in east section.

AUTOTRONIC ELEVATORING

"Autotronic Elevatoring," a recent achievement of Otis elevator research, is recommended for the traffic conditions in a hospital large enough to require three or more Electronic Signal Control elevators. This system provides an automatic operating program for each of six types of elevator traffic: UP PEAK, UP-DOWN, HEAVIER-DOWN, HEAVIER-UP, DOWN PEAK, and NIGHT Service. The supervisor merely sets a dial for the type of traffic prevailing, and the Autotronic system automatically dispatches the cars to handle the traffic most efficiently.

Hospitals Need



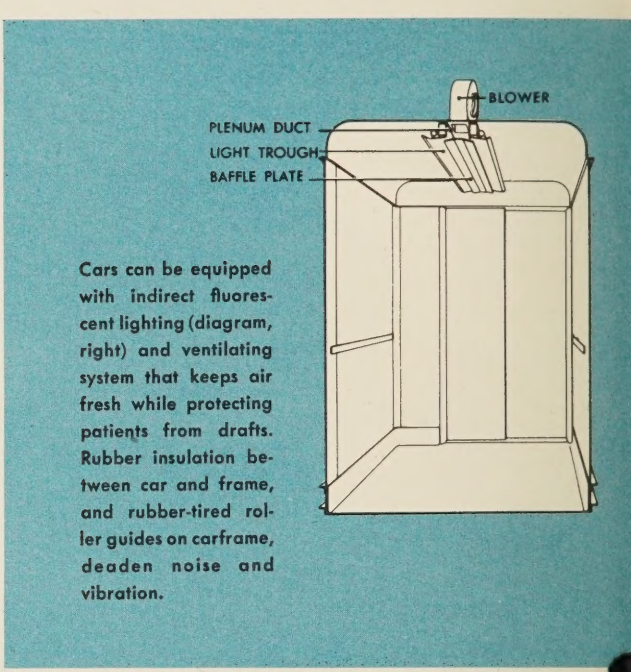
In hospitals, as in other buildings, the main job of passenger elevators is to carry people. One difference, however, is that in hospitals many of the people are patients, in beds, stretchers, or wheelchairs, who must be kept comfortable as they are moved from floor to floor. At times the elevators will be crowded with visitors. At still other times, in all but the largest institutions, the same elevators may be transporting food carts, laundry wagons, equipment, and even furniture.

size and shape

Because they must accommodate people in stretchers and beds, hospital elevator cars are usually deep and narrow in shape. Today most hospitals install cars with platforms that measure 5'8" x 8'4" (5'4" x 7'7" inside)—roomy enough to take one of the new fracture beds, plus a nurse, doctor, and elevator attendant. This elevator has a 4,000-pound capacity, enough to lift the large car fully loaded with standing passengers, plus an ample safety margin.

For the smaller hospital, a car platform 5'4" x 8'0" (5'0" x 7'3" inside) with a lifting capacity of 3,500 pounds, is occasionally used. This is large enough for most hospital equipment, but leaves little or no extra room for easy movement of beds and other bulky pieces.

If the elevator's location requires it, a car with *two* entrances can be installed. The additional entrance at the rear can open onto an ambulance platform, loading dock, or service corridor. A two-entrance elevator, however, is more costly and is only recommended where it will result in improved building layout or in construction economies.



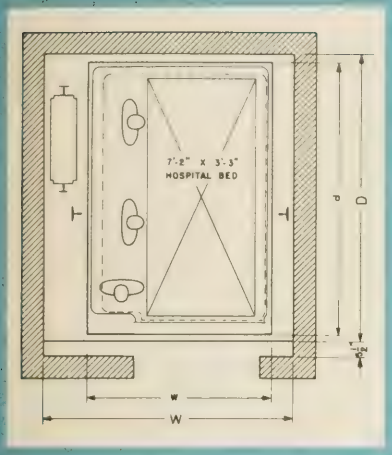
Cars can be equipped with indirect fluorescent lighting (diagram, right) and ventilating system that keeps air fresh while protecting patients from drafts. Rubber insulation between car and frame, and rubber-tired roller guides on carframe, deaden noise and vibration.

lighting and ventilation

To light long, narrow hospital cars uniformly, and without glare, Otis has worked out a simple indirect lighting system, with long fluorescent tubes behind baffles running the length of the car.

The ventilating system that Otis recommends for hospital cars is designed to force unpleasant odors out of the car and keep the air fresh, even in hot weather, without exposing patients to direct drafts. A blower and "plenum duct" feed fresh air evenly into the car from under the light baffles, which deflect the incoming air to the sides of the car and keep it from blowing directly on patients or passengers. The blower can change the air in the car about once every minute. In the plenum chamber is a space where germicidal

"HOSPITAL SIZE" ELEVATORS



How two sizes of elevator cars accommodate standard 7'2" x 3'3" hospital bed, plus physician, nurse, and elevator attendant. Solid line represents 4,000-lb. capacity car, from above; dotted line, 3,500-lb. Large size recommended because it has necessary room for easy movement of equipment. Car and hoistway dimensions in table.

Car and Hoistway Dimensions

Rated Capacity		Platform		Inside Car		Clear Hoistway		Sill	Doors (St. Ht. 7'0") Clear Opening
Pounds	Passengers	w	d	w	d	w	d		
3500	23	5'4"	8'0"	5'0"	7'3"	7'4"	8'5"	5½	3'8"
4000	27	5'8"	8'4"	5'4"	7'7"	7'8"	8'9"	5½	3'10"

Minimum Pit Overhead Dimensions

Car Speed (feet per minute)

	100	150-200	250	400	500
Pit*	4'3"	5'0"	6'9"	8'3"	10'3"
Overhead Heights**	23'6"	23'2"	24'4"	31'6"	33'0"

*Pit dimensions are measured from lower landing floor to pit floor.

**Overhead height is measured from upper landing floor to bottom of machine room roof beams.

Where pit and overhead dimensions differ for 3500 and 4000 pound capacity layouts of the same speed, the larger pit and overhead dimensions are shown. The dimensions in this table meet A.S.E. Code requirements. However, minimum values may vary slightly with local codes.

lamps may be installed to reduce the bacteria count of the air entering the car.

cleaning and maintenance

Otis hospital elevator cars can be kept clean with a minimum of labor. Side panels have a hard baked-enamel finish which washes clean easily and won't deteriorate under repeated action of soap, water, and disinfectants. Since sharp corners tend to accumulate dirt, corners are rounded or "coved". Rubber tile, with which the entire floor is surfaced, is also the usual material for base and corner "coves", but stainless steel coves can be ordered when available.

If one car will have to double as both a passenger and freight elevator, it can have studs from which protective pads may be hung to safeguard the wall finish when the car is carrying furniture, heavy equipment, or other freight. If the walls are likely to be marred by food carts or other vehicles, rubber "bumper strips" or stainless steel wainscoting can be installed.

Schmidt, Garden & Erikson, architects. Tunnicliff Construction Company, contractors. Interesting use of two-entrance car (left) in St. Francis Xavier Hospital (below), Dubuque, Iowa. Front entrance opens on ambulance platform and reception hall, is used by patients and visitors; rear door, opening on kitchen in basement, is used for food, supplies, and equipment. Centrally located hoistway is easier to heat. Two Collective Control elevators serve this six-story, 118-bed hospital.

Four Factors in Choosing ELEVATOR ENTRANCES

The special conditions of hospital service call for elevator entrances—car and hoistway doors—with special qualities.

extra width

Entrances must be extra wide so that nurses and doctors can get into an elevator alongside a bed or stretcher. Otis hoistway doors for hospital elevators are large enough to admit the bulkiest equipment—such as an oversize fracture bed—normally moved from floor to floor. The size normally recommended is 3'10" wide by 7'0" high (clear opening).

ability to "take it"

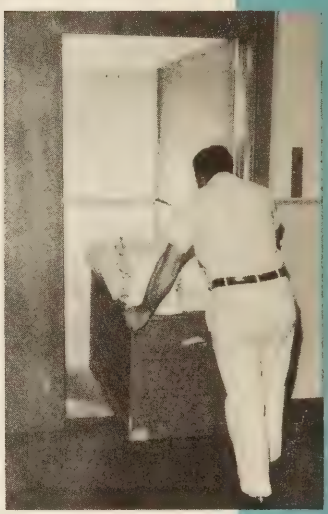
In a hospital, elevator entrances take extra punishment from food carts, beds, and other vehicular traffic. To stand up under day-to-day pounding, Otis hospital elevator entrances are made of sturdy, heavy-gauge steel, with tough finishes which resist marring and scratching.

For long wear, frames and doors are finished in enamel, baked at high temperature onto a "Bonderized" steel base, or, if natural metal finish is desired, they may be constructed of a decorative metal such as architectural bronze, nickel-silver, or stainless steel when these materials are available. Entrances of tough stainless steel are often preferred in hospitals because they resist corrosion and are easy to clean.

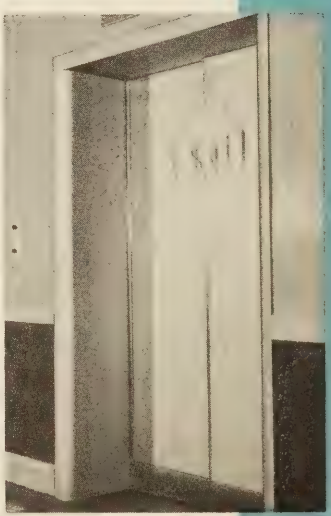
power operation

Car and hoistway doors should be power-operated. Power operation spares busy doctors,

When heavy equipment is rolled into and out of hospital elevators an occasional bump or rub against the entrance is hard to avoid. That's why we use 14-gauge steel. This elevator serves three floors in the X-ray clinic of St. John's Hospital, Tulsa, Oklahoma.

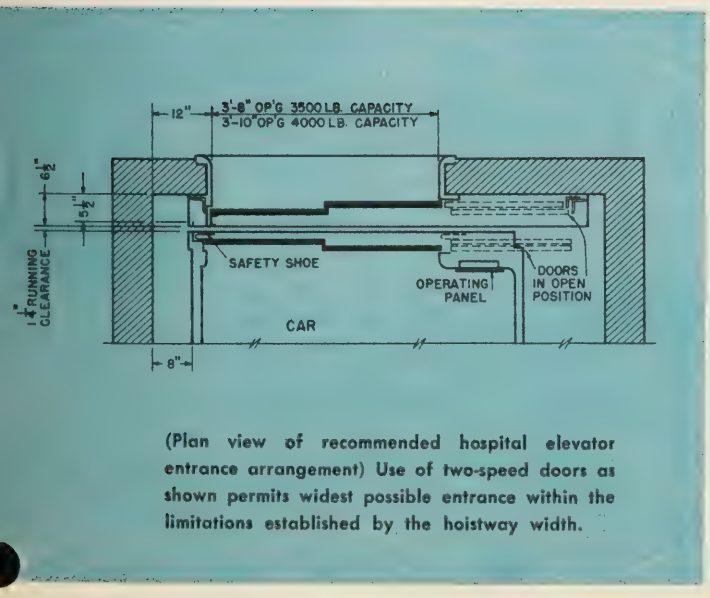


Wear and tear on hospital elevator entrances never stops. Day and night, supplies and equipment are being wheeled through the elevator entrances of the Irvington (New Jersey) General Hospital. This elevator was recently modernized to Collective Control with power-operated doors.



The entrances on the main floor of St. Judes Catholic Hospital, Montgomery, Alabama, have rounded side jambs for an inviting appearance and for facilitating the flow of traffic in and out of the entrance. The doors are a solid color baked enamel with etched bronze plaques.

Leon B. Senter, architect. Hutter Construction Company, contractor. In addition to the X-ray clinic elevator illustrated on page 10, St. John's Hospital in Tulsa, has a total of 5 passenger or service elevators, one dumbwaiter and two freight elevators to service its seven floors and 500 beds.



(Plan view of recommended hospital elevator entrance arrangement) Use of two-speed doors as shown permits widest possible entrance within the limitations established by the hoistway width.

nurses, and other staff members from struggling with manually operated doors. To provide the extra-wide openings needed in hospitals without wasting space at the side of the hoistway, the "two-speed slide" door arrangements, shown in the diagram, is usually recommended. However, when space is available, center opening type doors are usually preferred. Car doors can be equipped with rubber-tired door hangers for quieter operation.

making hospital elevators super-safe

All Otis elevator entrances are equipped with safety interlocks. Their purpose is to prevent the car from starting until all hoistway and car doors are closed and locked and to prevent doors from opening if the car is not at the landing. Power operated doors on automatic elevators have safety shoes or edges to reverse and re-open the door quickly if the shoe strikes any obstruction while the door is closing. The door can also be held open and prevented from closing by hand pressure on the safety shoe, or by pressing a "DO" (Door Open) button on the car operating panel.

FREIGHT ELEVATORS

Much of the floor-to-floor movement of people and supplies in the large hospital, and nearly all of it in the smaller institution, can be handled by the hospital's complement of passenger elevators and dumbwaiters. But under certain conditions there are loads too bulky for a passenger elevator, freight that must be carried without interfering with regular elevator service, and opportunities to cut handling costs by moving supplies directly from where they are to where they are wanted . . . in short, many jobs that can best be done by freight elevators. They efficiently serve such hospital facilities as

Kitchens
Store Rooms
Supply Rooms
Laundries
Ambulance Houses
Mortuaries
Boiler Rooms

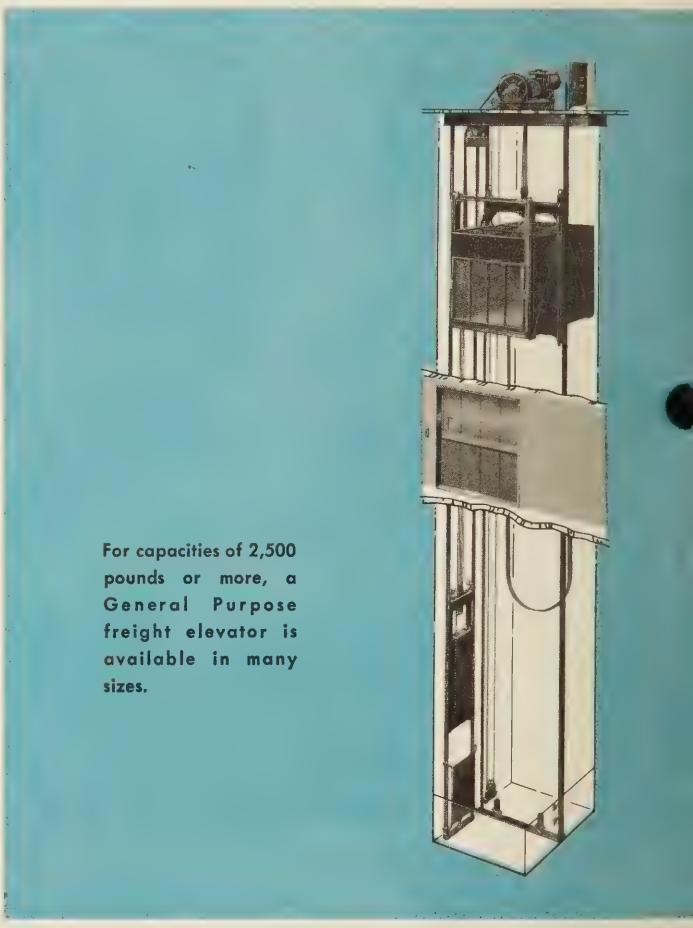
"Heavy handling" in the modern hospital can be turned over to Otis freight elevators of three standardized types.

bringing in supplies, carrying out waste . . .

WITH SIDEWALK ELEVATORS. Transporting bulk supplies from street level to basement storerooms and kitchens, and carrying waste up from cellar incinerators and dustbins, is the kind of work that Otis sidewalk elevators can do with savings of time and manpower. Sidewalk elevators often take the place of special loading docks in metropolitan institutions where space is at a premium. Traveling at 25 feet per minute from sidewalk level to one or two basement levels, Otis sidewalk elevators have a maximum rise of 30 feet, a lifting capacity of 2,500 pounds, and platforms measuring from 2'10" x 3'7" to 5'6½" x 4'10". They operate by means of safe, simplified "constant pressure" push-button controls.

an economical elevator for inside the hospital

Within the hospital, an economical installation for any rise up to 35 feet can be obtained with the Otis Self-Supporting freight elevator. This type elevator is often used for service from loading docks to kitchens and storage rooms, between laundries and distribution points, and for mortuary applications. Its outstanding feature is its self-supporting framework, which permits installation in most new or existing hospitals without reinforcing the building structure, adding overhead supports, or constructing a penthouse or overhead machine room.

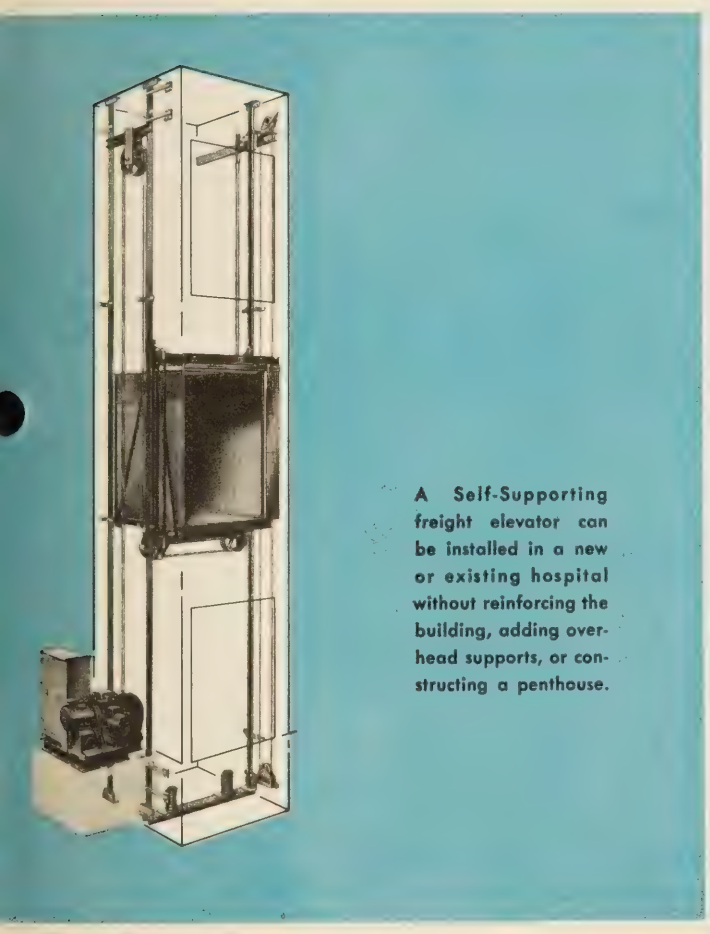


For capacities of 2,500 pounds or more, a General Purpose freight elevator is available in many sizes.

An Otis Self-Supporting freight elevator can economically and efficiently serve a maximum rise of 35 feet with two or three stops. The three standard capacities are 1,500, 2,000, and 2,500 pounds, with platform sizes of 5'4" x 6'0", 6'4" x 7'0", and 6'4" x 8'0", respectively. Car speed is 25 feet per minute. Operation is normally by continuous pressure on "Up" and "Down" but-

solve special problems

tons at landings and within the car, but single automatic push-button operation can be substituted if desired. Cars can be equiped with horizontal folding or vertical lifting gates, depending upon available headroom above the upper landing. Thanks to the self-supporting feature, this elevator requires no penthouse or overhead machine room and can be installed at low cost,



A Self-Supporting freight elevator can be installed in a new or existing hospital without reinforcing the building, adding overhead supports, or constructing a penthouse.

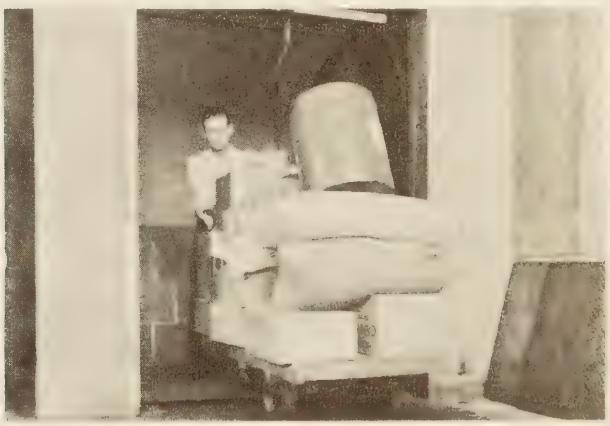
even where building conditions previously made the installation of freight elevators impossible.

general purpose freight elevator . . .

ENGINEERED TO SPECIFIC NEEDS

Where demands on the freight elevator are greater—if it must serve more than three floors or carry larger and heavier loads—one of the many sizes of Otis General Purpose freight elevators may be installed. While these elevators are sturdily constructed of standardized component parts, each installation is specially designed to fit individual requirements . . . from lifting heavy supplies to the upper floors of "skyscraper" hospitals to carrying food carts from kitchen to patient levels.

Otis General Purpose freight elevators are available in capacities from 2,500 to 10,000 pounds, and with platforms from 5'4" x 7'0" to 10'4" x 14'0". Collective control operation is usually specified. All-steel Otis-built hoistway doors of the vertical bi-parting type are standard for this type of installation. Doors and car gates should be power-operated.



Basement landing of the sidewalk elevator in the main building of Charity Hospital, New Orleans. The elevator's capacity is 1,500 pounds.

Holmes & Flinn, architects. Guy & McClintoch Company, contractors. **West Suburban Hospital, in Oak Park, Illinois, has one Signal Control elevator for passengers and another for service, two Signal Control cars for either passengers or service, and three other service elevators.**

"Housekeeping" simplified

The 225-bed, six-floor Hendrick Memorial Hospital in Abilene, Texas, uses this Multi-Button Control dumbwaiter to distribute food to patients. Nurses and orderlies can send dumbwaiter to or call it from any landing.

An efficient way to move food trays, drugs, linen, surgical instruments, and other small items of equipment and supplies from floor to floor is often by means of electric dumbwaiters. Many up-to-date hospitals are using dumbwaiters for such jobs as:

Handling special diet trays.
Carrying clean linen from laundries to distribution points; returning soiled material to laundries.
Transporting drugs from pharmacies to "out patient" departments and to upper floor nurses' stations.
Distributing sterile supplies.

factors to consider

To a large extent, a hospital's dumbwaiter installation will depend on its food distribution system. Other important factors are the location of such facilities as pharmacies and sterilization rooms and, of course, the size and height of the hospital.

Since Otis manufactures dumbwaiters with capacities ranging from 100 to 500 pounds and speeds from 50 to 300 feet per minute, there is a wide variety from which to choose. Actual size, capacity, and speed will depend on the job the dumbwaiter is to do.

size, capacity, speed to do the job

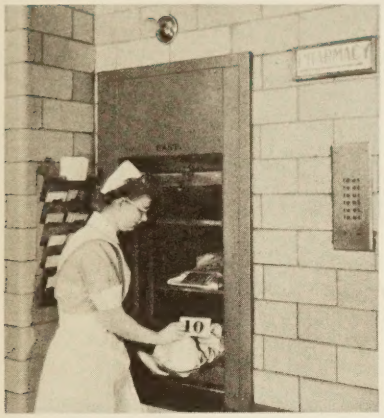
The 24" x 24" x 36" dumbwaiter car is often preferred where food trays are to be handled, because it is large enough to take the medium-sized—20" x 15½"—tray. With two shelves, ten inches apart, this dumbwaiter delivers three loaded trays on each trip and has a 16" space above the top tray for pitchers, bottles, etc. Shelves can have "turned down" lips for ease in sliding the trays in and out. Capacity of 200 pounds is generally recommended, enough to lift an average-sized car fully loaded with dishes stacked one on top of the other.

Speed usually varies with the height of the rise:

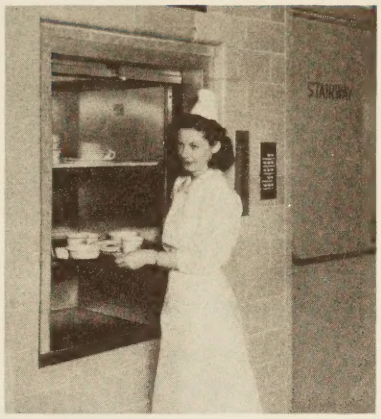
for 2 floors	*50 f.p.m.*	*for 5 to 12 floors*	*150 f.p.m.*
for 3 to 5 floors	*100 f.p.m.*	*over 12 floors*	*300 f.p.m.*

Speeds faster than 300 f.p.m. can rarely be justified in a hospital, because a dumbwaiter's "running time," which depends upon its speed, is only a small part of the round-trip schedule of most dumbwaiter operations. In recent studies of food-tray distribution by means of dumbwaiters, it was found that "running time" averaged less than 20% of the total distribution cycle. The remaining 80% was used up in loading and unloading the dumbwaiter and distributing the trays to patients.

with HOSPITAL DUMBWAITERS



One of the two Central Station-type dumbwaiters which carry supplies to nurses' stations on all floors of Wesley Hospital, in Chicago. This hospital has four other dumbwaiters, for food and surgical supplies.



The General Rose Memorial Hospital in Denver uses this dumbwaiter for food distribution and other purposes. The car has a stainless-steel interior and a lifting capacity of 300 pounds.

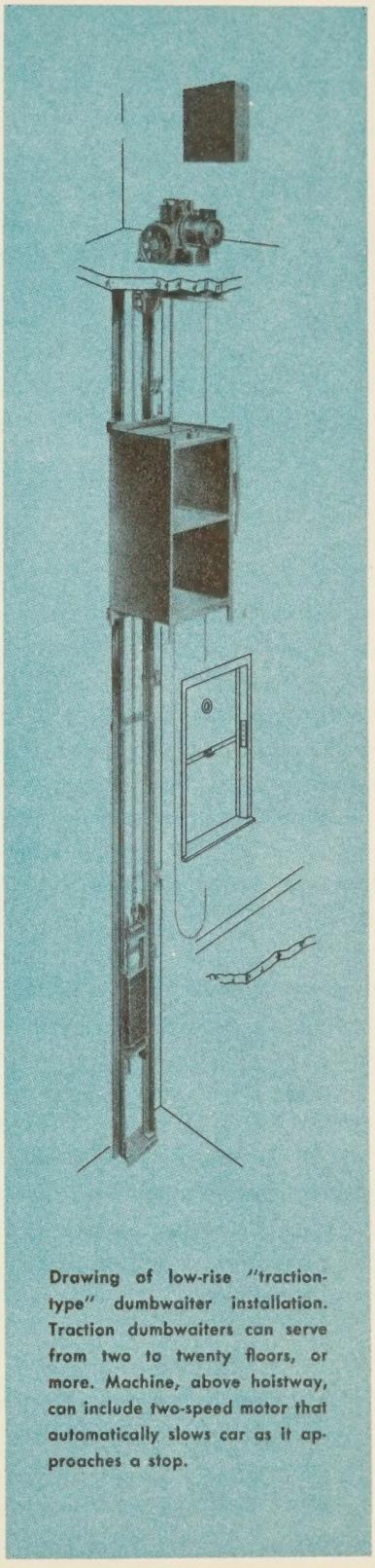
control system determined by need for service

Choice of a control system also depends on the type of service required. A dumbwaiter serving two floors, for example, is usually equipped with a "Call and Send" system, with which the car can be called to or sent from either landing by means of push buttons conveniently located at each hoistway door.

If the dumbwaiter serves three or more floors, intensity of service determines the type of control. Economical "Multi-Button" control is suitable for the intermittent service required of laundry lifts and similar installations. Multi-Button control, like Call and Send, permits the car to be called to and sent from any landing.

"Central Station Dispatching" on the other hand, has been designed for intensive dumbwaiter service, as in a food-tray distributing system. This is a comprehensive "send and automatic return" control system that incorporates:

Shutze & Armistead, architects. Barge-Thompson Company, contractors. This seven-story unit of Emory University Hospital, near Atlanta, Georgia, has 320 beds. It is equipped with three Signal Control elevators, four other passenger elevators, and a 2,500-pound service elevator linking the supply room and kitchen.



Drawing of low-rise "traction-type" dumbwaiter installation. Traction dumbwaiters can serve from two to twenty floors, or more. Machine, above hoistway, can include two-speed motor that automatically slows car as it approaches a stop.

1. *A bank of buttons at the central station (kitchen, for example) to dispatch the car to other floors.*
2. *A button for "recalling" the car when necessary.*
3. *A visible and audible signal at each floor to notify staff members of the arrival of the car. For special situations it can also be equipped with such extra features as:*
   a) A signal to notify the dispatcher that the car has returned.
   b) An automatic device that returns the car to the central station after it has been unloaded.
   c) An annunciator or two-way microphone system to notify the dispatcher when the car is required at another floor.
   d) A multi-light indicator to show which floor the car is at.

With Central Station Dispatching, the dietician has exclusive control of the dumbwaiter during meal periods.

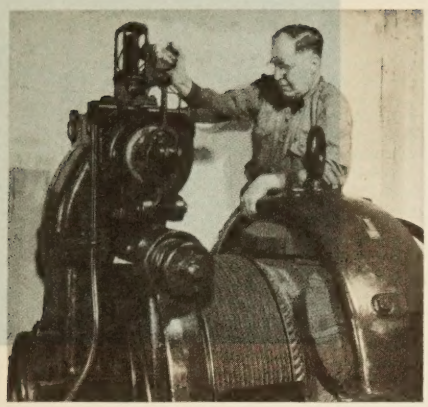
Further refinements of the control system can be provided if required to fit a dumbwaiter installation more closely to a hospital's specific needs. A "Multi-Floor dispatch" feature, for example, permits the car to be sent from one floor to *several* other floors, in predetermined order, to distribute sterile supplies and drugs. A dumbwaiter can also be equipped with a "Single Floor Dispatch" type of control that provides direct, uninterrupted service between floors for the safe distribution of pharmaceuticals, blood samples, or supplies for contagious wards. If a car under "non-interruptive" control arrives at a landing and is not unloaded within a designated time, it returns to the dispatching point before it can be called or sent elsewhere.

All we can do here is to suggest types of dumbwaiters and dumbwaiter control systems that are available for varying hospital requirements. Careful study by Otis experts of the situation in your hospital will form the basis for planning the dumbwaiter installation that will best meet your needs.

J. R. Edmunds, Jr., architect. Johnson and Willard, contractors. Ten-story East Tennessee Baptist Hospital, in Knoxville, has 216 beds. It is equipped with one Collective Control elevator, one Signal Control elevator, and two dumbwaiters. A second Signal Control elevator is expected to be installed late in 1951.

This general-purpose dumbwaiter, with a capacity of 150 pounds, carries pharmaceuticals and other supplies from floor to floor of Mercy Hospital, Portland, Maine.

The two Multi-Button dumbwaiters in East Tennessee Baptist Hospital at Knoxville. One car carries sterile, the other, unsterile, supplies.



Otis-trained technicians regularly service Otis elevator and dumbwaiter equipment, replace worn parts with Otis factory-made components. Otis maintenance can keep elevators running "like new" for life of building.

OTIS MAINTENANCE— for dependable service, predictable cost

Installing the right elevators and dumbwaiters in a hospital is only part of the problem . . . the equipment must be kept running efficiently, for as many years as the building itself continues in use.

complete service facilities near you

Otis service facilities are available to you whenever you need them. At your command 24 hours a day, there is an Otis branch office near you, staffed and equipped to do every kind of regular or emergency service and repair job. This complete factory branch has all the special tools, testing devices, and lubricants needed to service your installation properly, and it carries stocks of spare parts specifically engineered for the Otis elevators and dumbwaiters in your hospital. Its staff includes a crew of mechanics with years of experience in servicing Otis equipment.

Otis comprehensive maintenance plan

To provide users of Otis equipment with maximum service at minimum cost throughout the entire life of the elevator, we offer the Otis Complete Maintenance Plan. Although this service is entirely optional, it is already being used by owners of more than 45,000 Otis elevators, including hundreds of hospital elevators. When your hospital has an Otis maintenance contract, trained examiners thoroughly inspect your elevator and dumbwaiter installations at regular intervals, make necessary adjustments, and lubricate the parts that require it. They replace worn parts with new components from the Otis factory. Such "preventive maintenance" reduces service failures to a minimum. Should an emergency arise, however, men and equipment from the nearest Otis branch will rush to your aid, at any hour of the day or night.

a cost that can be budgeted

A flat monthly payment covers the entire Otis maintenance contract. There are no "extras" for repairs or emergency service. You pay only the agreed-on monthly charge, for which we do everything necessary to keep your elevators and dumbwaiters running at peak efficiency. Maintenance becomes a regular, predictable cost without unexpected expenses for repairs and emergency service that are difficult to include in your hospital's budget.

getting the most from your elevators

COMPLETE MAINTENANCE—including inspection, adjustment, and lubrication at regular intervals, and the prompt replacement of worn parts—keeps elevators and dumbwaiters operating like new during decades of service. Your hospital's investment in vertical transportation equipment retains its value without excessive depreciation. Particularly important in hospital service, the possibility of a breakdown is reduced by comprehensive maintenance. Only when it is properly maintained can elevator and dumbwaiter equipment give efficient, dependable service.

Otis—your specialist in vertical transportation

Charles C. Hartmann, *architect*
R. H. Pinnix, *contractor*

O'Connor & Kilham, *architects*
Edward Corning Co., *contractor*
Syska & Hennessy, Inc., *consulting engineers*

Coolidge, Shepley, Bulfinch
& Abbott, *architects*
George A. Fuller Company, *contractors*

Elevator and dumbwaiter equipment can be manufactured in quantity, but every installation must be individually planned to meet a particular set of requirements. This is the purpose of the Otis Engineering and Planning Service, which is at your disposal without cost or obligation. Otis will be happy to have its staff of professionally competent experts study the situation in your hospital, and make sound, unbiased recommendations based on your needs.

Whatever your problems in vertical transportation —whether they involve installation, modernization, or maintenance—bring them first to the organization that is first in vertical transportation . . . the Otis Elevator Company. Without any obligation on your part, qualified Otis experts will be happy to study your hospital's problems and discuss their solution. Call on Otis . . . the nearest office is listed in your phone book.

Lexington (N. C.) Memorial Hospital (top), with 100 beds, has one OTIS elevator and one OTIS dumbwaiter. Two OTIS elevators serve 50-bed wing (middle) of Northern Westchester Hospital, Mt. Kisco, N. Y. Hartford (Conn.) Hospital has 725 beds, seven OTIS elevators, one OTIS dumbwaiter.

OTIS ELEVATOR COMPANY
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